

SITE SAFETY ALERT

Critical event logging & preventative diagnostics for maintenance

The Incident:

During tanker delivery procedures at a UK concrete block plant, drivers were recording **multiple high-pressure events and safety shutdowns**. The silo protection equipment was passing the pre-delivery tests and the air venting filter unit had recently been serviced with new cartridges. Hycontrol engineers were asked to investigate why the pressure alarm was triggering with such regularity.

The Investigation:

The system was found to be in good working order, with the pressure sensor operating within the correct range and the Pressure Relief Valve opening and closing correctly during the test cycle. This indicated to the engineers that the safety system was not at fault, **pointing instead to an issue with pressure exiting the silo system**.

Upon investigating the condition of the filter, the engineers discovered one of the solenoid valves controlling air-flow to the reverse jet cleaning nozzles had failed. This meant three of the seven filter cartridges were not self-cleaning and were now totally blocked with product (see *photographs, right*). This meant a **43% reduction in air-flow through the filter** and as a result pressurised air was building up inside the silo, causing near-miss events.

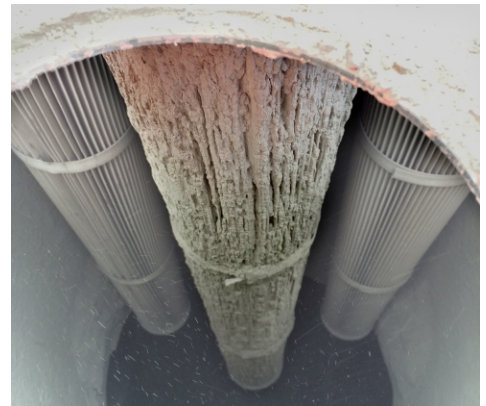
This highlights the benefits of effective maintenance logging. By interpreting the system log of over-pressurisation events, service engineers were able to quickly pinpoint the issue with the filter vent unit and rectify it before it became a major problem for the site.

Action:

- Ensure an effective auto shut-off silo protection system is installed.
- Ensure the silo safety system records PRV lifts and pressure events, as this is vital for preventative maintenance. The site in this example assumed there could not be a problem with the filters as they had recently been replaced, however if it had not been for the Silo Protection System raising the alarm they may have faced catastrophe. The log of pressure events directed the engineers to the filter unit.
- Ensure a regular silo servicing contract is in place to maintain filters and safety equipment, using a company with competently trained engineers.
- Be site aware and look for visible signs of failure of the delivery process, such as powder on the silo top etc. Carry out a physical examination and test (not just visual) on the pressure sensor, PRV and high-level sensor.
- Train staff to identify, log and monitor signs of danger such as PRV dust build-up, multiple high-pressure alarms and PRV lifts. This will provide invaluable data for preventative maintenance purposes.

Other Learning Points:

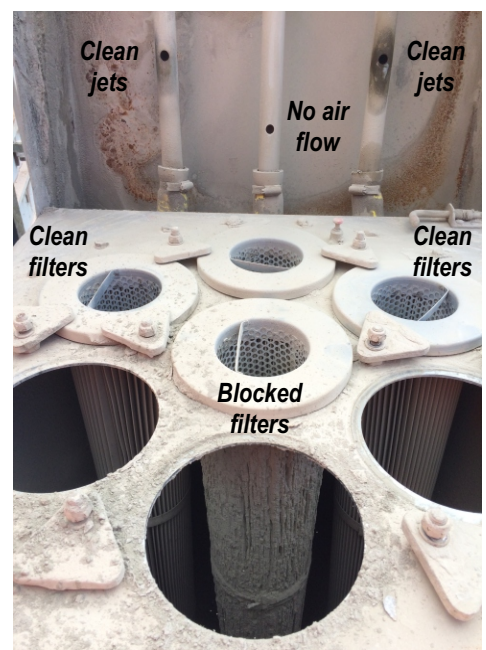
- Product blowing out of a regularly-opening PRV will eventually block the valve, which will trap pressure inside the silo. Silos can easily be ruptured and filter units can be blown off the roof by a pressure build-up of as little as 1 psi.
- Even on the site in this example, where a regular maintenance schedule was in place and the filter cartridges had been replaced only weeks before, a potentially disastrous situation quickly emerged. **NEVER IGNORE A PRESSURE RELIEF VALVE LIFT OR A PRESSURE ALARM - THESE ARE WARNINGS OF A NEAR-MISS EVENT.**



Due to a failed air valve, three of the filter units' seven filter cartridges had become blocked with powder, severely restricting airflow out of the silo.



The trapped pressure from the blockage was causing the SPS pressure alarm to trigger and the PRV to lift, in order to protect the silo from damage.



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HOW TO AVOID THIS SCENARIO AND

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